11

REMARKS/ARGUMENTS

1.   The Examiner has raised obviousness objections to independent claims 5, 6, 22 and 23 and their corresponding dependent claims but has indicated allowability of independent claims 1, 4, 18 and 21 and their corresponding dependent claims. Although the Applicant could argue for the allowability of the rejected claims, in the interests of prompt examination, the Applicant has chosen to cancel claims 5-7 and 22-24 and to amend the remaining claims to depend only from the allowable independent claims.

In light of these amendments, the Applicant submits that the claims are now allowable.

2.   In paragraph 2 of the Office Action, the Examiner has requested that "Memjet™", as a trademark should be accompanied by the generic terminology. In paragraph 2.1 the Examiner reveals the reason for this request, namely:

> *"Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to rpevent their use in any manner which might adversely affect their validity as trademarks."*

In reply, the Applicant notes that the Assignee of the present application, Silverbrook Research Pty Ltd, is the owner of the Memjet trademark and that the Assignee is satisfied that the use of Memjet in the present specification will not adversely affect the validity of the Memjet trademark.

3.   In paragraph 4(A) of the Office action, the Examiner has requested that the cross-referenced application on pages 1 and 2 of the specification be referred to by their US serial number or patent numbers. The Applicant has proposed to amend pages 1 and 2 of the specification in accordance with the Examiner's request.

4.   In paragraph 3(B)(4) of the Office Action, the Examiner has objected to the drawings on the grounds that they include reference numbers which are not mentioned in the specification. Paragraph 4(B) of the Office Action includes a complementary objection to the description. In reply, the applicant notes that the following reference numbers do appear in the specification at the following places:

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Reference	Appears On
838	Page 38, lines 7 and 18
811	Page 28, line 30 and page 31, line 9
675	Page 76 line 27
45	Page 19, line 10

However, the Applicant has proposed to delete the following reference numbers from the figures indicated as they do not appear in the description:

Reference	Deleted from Figure
804	26
837, 838, 841, 842	25
333	20
861	29
869	32
906	39
810, 812, 813, 814	22
804, 805, 827, 828	24
841	41
192	8
606, 609, 610, 619	11
612, 619, 623, 706	12
646, 669, 706	12a
646	13
1120	50

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In addition, the Applicant notes that although item number 350a and 350b are not specifically referred to in the specification, item number 350 is indicated as referring to the *"Memjet™ printheads"* (eg Page 72, lines 17 to 19). The Applicant submits that one of ordinary skill in the art would understand 350a to refer to one printhead and 350b to refer to another printhead. The Applicant submits for this reason that Figure 15 need not be amended.

5.   In paragraph 3(A)(1) of the Office Action the Examiner has objected to claims 11, 12, 28 and 29 on the grounds that the following feature does not appear in the drawings:

> *"the request to authorise the transmission of electronic mail from the first user to the second user becomes disabled after a pre-determined number of uses."*

The Applicant notes that the Examiner has not objected to claims 10 and 27 which refer to the authorization becoming disabled after a predetermined period of time. The Examiner has therefore conceded that that feature appears in the drawings. The Applicant also notes that the features of claims 11, 12, 28 and 29 are disclosed in the first paragraph on page 6 of the specification.

Since the disablement of the authorization (after a time period) is disclosed in both the drawings and the specification and since the disablement of the authorization (after a number of uses) appears in the specification and is only a slight variation on the time period option, the Applicant submits that one of ordinary skill in the art would not need an additional figure specifically directed at the second embodiment in order to fully understand the invention.

For these reasons the Applicant submits that claims 11, 12, 28 and 29 are fairly based upon the specification and that amendments to the drawings are unnecessary.

6.   In response to the Examiner's various drawing objections in paragraph 3(B), the Applicant responds as follows, using the same numbering as in the Office Action:

3(B)(1) Figure 19 is clearly divided into three parts, (a), (b), and (c) which one of ordinary skill in the art would readily understand as corresponding to the reference to *"Figures 19(a), 19(b) and 19(c)"* in the specification. In addition, the applicant has amended page 11, line 17 of the specification to refer to Figures 19(a), 19(b)

and 19(c). For these reasons the Applicant submits that the figure does not need to be amended.

3(B)(2)(a) "50" only refers to "PAGE ID." Box four shows two items of information "PAGE ID" and "POSITION." The "POSITION" simply does not have a reference number indicated. For these reasons the Applicant submits that the figure does not need to be amended. Similar comments apply in relation to Examiner's objections 3(B)(2)(a)(1) through 3(B)(2)(a)(8).

3(B)(2)(b)   The Applicant concedes that the "clip" should be designated "142" instead of "143" and has proposed to amend Figure 9 accordingly.

3(B)(2)(c)   The Applicant concedes that the "grip pad" should be designated "141" instead of "142" and has proposed to amend Figure 9 accordingly. Corresponding amendments have been made to the specification on page 69.

3(B)(2)(d)   The Applicant concedes that the "tag encoder" should be designated "766" instead of "765" and has proposed to amend Figure 16 accordingly. The Applicant notes that this amendment effectively deals with Examiner's objection 3(B)(3)(a) simultaneously.

3(B)(3)(b)   The specification at page 80, lines 17-19 has been amended to make clear that reference numbers 1016 and 1017 are not shown in the Figures.

7.   In response to the Examiner's various specification objections in paragraph 4(C), the Applicant responds as follows, using the same numbering as in the Office Action:

4(C)(1) The Applicant has amended page 15, lines 19 to 26 as suggested by the Examiner.

4(C)(2) The Applicant has amended the phrase on page 20, line 22 from "code code" to "code."

4(C)(3). The Applicant has amended page 21, line 2 as suggested by the Examiner.

4(C)(4) The Applicant has amended page 11, line 17 as suggested by the Examiner.

4(C)(5) The Applicant has amended page 41, line 18 as suggested by the Examiner.

4(C)(6) Page 12, line 14 includes the following explicit description of Figure 41: *"Figure 41 is a schematic view of a hyperlink request class diagram."*

4(C)(7) The Applicant has amended page 71, lines 4-5 as suggested by the Examiner.

4(C)(8) Page 11, lines 9-10 include the following explicit description of Figure 15: *"Figure 15 is a schematic block diagram of duplexed print engine controllers and Memjet™ printheads associated with the printer controller shown in Figure 14."*

4(C)(9) Page 11, lines 11-12 include the following explicit description of Figure 16: *"Figure 16 is a schematic block diagram of the print engine controller shown in Figures 14 and 15."*

4(C)(10) The Applicant has amended page 76, line 7 as suggested by the Examiner.

4(C)(11) The Applicant has amended page 88, line 1 to include the phrase "WE CLAIM" as suggested by the Examiner.

4(D)   The Applicant submits that claims 11, 12, 28 and 29 are fairly based upon the first paragraph on page 6 of the specification and therefore do not lack antecedence basis within the specification. The Applicant notes that this response also deals with Examiner's objection 6.1(A).

8.   In response to Examiner's request in paragraphs 9(A), 9(B) and 9(D)-(F) for copies of the cross referenced documents, the Applicant submits that these documents are entire books or volumes of journals and it is impractical to provide these to the Examiner. The Applicant notes that the Examiner has not considered those documents during Examination.

9.   In response to Examiner's request in paragraph 9(C), the Applicant encloses a copy of the "Anoto Technology Description, Anoto April 2000" as requested. That document is a two page document which depicts a pen writing the letter "A" on the first page. That document is untitled but was downloaded from the Anoto website (www.anoto.com) on 18 April 2000. For the Examiner's information, the Applicant also attaches another (four page) document entitled "The Anoto White Paper" which was similarly downloaded from the Anoto website on that day. The Applicant also attaches a third document being an article from New Scientist vol 166 issue 2234 page 6 dated 15 April 2000 which shows that similar information to the information described in the first two (undated) articles was publicly available on 15 April 2000.

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It is respectfully submitted that all of the Examiner's objections have been successfully traversed. Accordingly, it is submitted that the application is now in condition for allowance. Reconsideration and allowance of the application is courteously solicited.

Very respectfully,

Applicant:

_____
PAUL LAPSTUN

_____
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              Balmain NSW 2041, Australia

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Anoto Technology

Anoto Pen + pattern paper = Hi →

The Anoto Technology is a combination of an ingenious pattern, advanced image processing, Bluetooth™ wireless communication and an information infrastructure. These features let you use pen and paper together with all the possibilities of information technology.
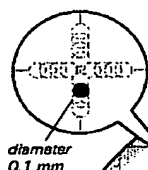
Bluetooth Transceiver
The Bluetooth wireless technology is a *de facto* standard that enables all things that are now connected by cable to be connected without cables.

Battery
A rechargeable battery enables a full day of use.

The pattern
The pattern consists of small dots slightly dislocated from a strict grid arrangement. A very small part of the pattern, 2x2 mm, gives the exact location in the full pattern.

diameter 0.1 mm

3 mm

3 mm

Ink Cartridge and Force Sensor
The pen holds an ordinary ink cartridge – all that is written is visible to the eye just like a normal pen. A force-sensing resistor measures the stylus tip force.

Memory
The pen contains enough memory to locally store several pages of writing.

Processor
A dedicated image processor calculates the positions in the full pattern space in real time.

Camera
The pattern is illuminated by infrared light and a digital camera, i.e. CMOS sensor, aquires images of the pattern at 100 frames per second. The ink from the pen is not visible to the camera. In this way the pattern is not destroyed by writing on it.
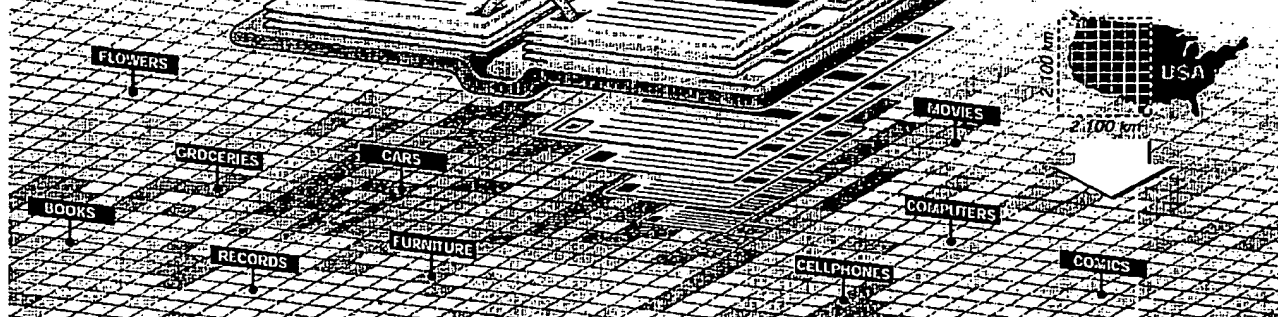
The user paper
The pattern appears as a faint grey shade on the paper and enables seamless integration with the digital domain of Anoto and further.

The predefined area
Different parts of the full pattern space can be dedicated to different applications such as time managers, note-pads; e-commerce etc. Certain parts of the space define functions such as store and send.

The full pattern
Every 2x2 millimeter of the pattern gives the exact location, down to 1/30 of a millimeter, in the full pattern that has the size of 73 000 000 000 000 A4 pages – equivalent to half the size of the USA.
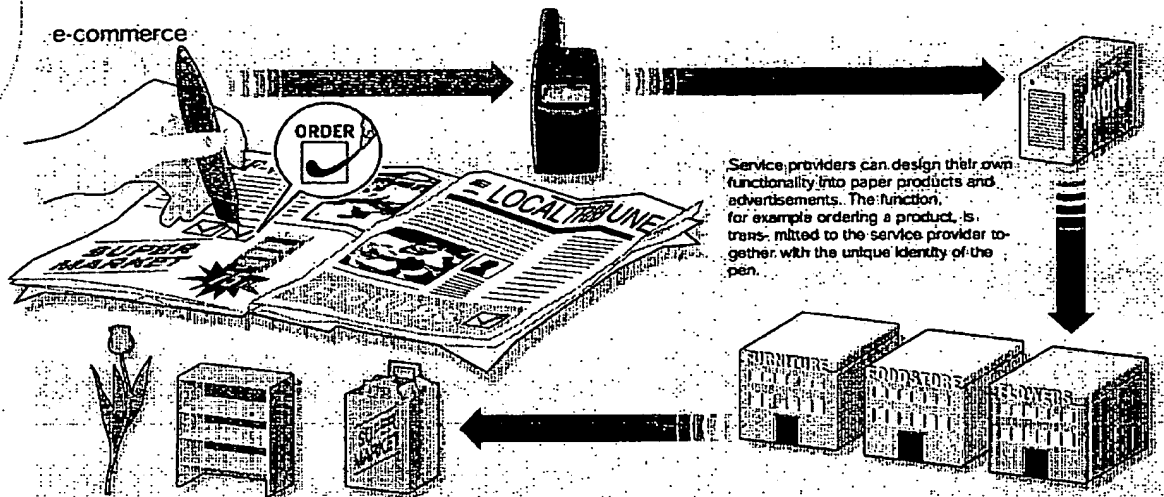
FLOWERS

GROCERIES   CARS

BOOKS

RECORDS   FURNITURE

MOVIES

2 100 km

2 100 km

USA

COMPUTERS

CELLPHONES   COMICS

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Applications

e-commerce

Service providers can design their own functionality into paper products and advertisements. The function, for example ordering a product, is trans- mitted to the service provider to- gether with the unique identity of the pen.
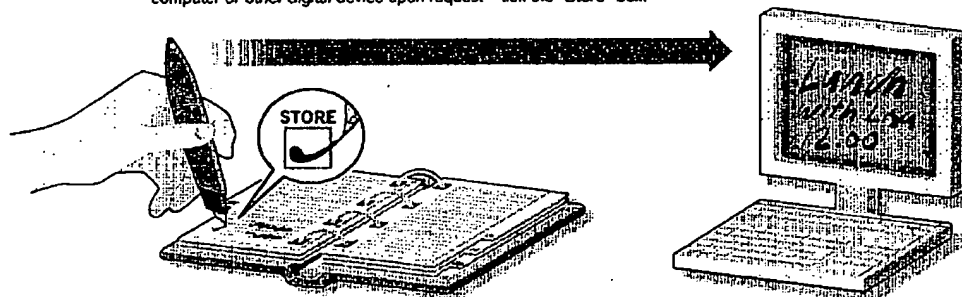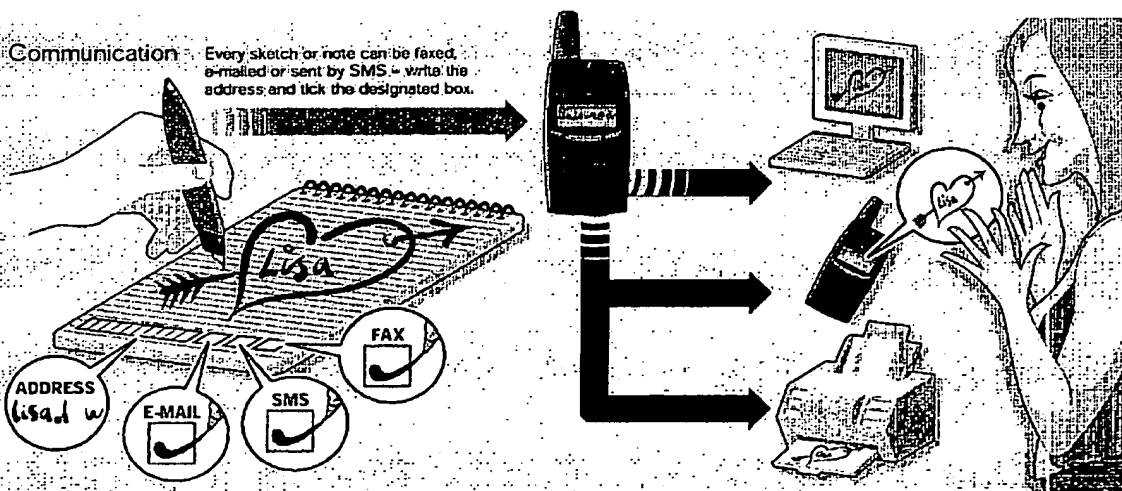
Digital storage

Everything written or sketched with the pen can be transferred to your computer or other digital device upon request – tick the "Store" box.

Communication

Every sketch or note can be faxed, e-mailed or sent by SMS.– write the address and tick the designated box.

anoto™

The Anoto White Paper

The Anoto Pattern

The Anoto input device is just a piece of ordinary paper on which a proprietary pattern has been printed. For the eye this pattern is experienced as a slightly off-white color (1-3% black). A very small portion of the pattern (1.8x1.8 mm) uniquely defines the position on the full pattern, which encompasses an area exceeding 4.6 million km^2 (i.e. half the USA or $73x10^{12}$ A4 pages).

Construction

The Anoto pattern consists of small dots, with a nominal spacing of 0.3 mm. These dots are slightly displaced from a structured grid thus forming the proprietary Anoto pattern. When writing with an Anoto pen on a paper printed with the pattern, digital snapshots of the pattern are taken every 1/100 second. Every snapshot contains at least 6x6 dots from the grid, equal to 2^{72} bits of information, which is enough to make a calculation of the position at a resolution of 0.03 mm (30 microns).

A special *Function Pattern*, that can be recognized directly by the pen, has been reserved for a limited number of commands, e.g. Store, Send, To Do, Address, etc. All other commands originating from the Function Pattern will be decoded by the Anoto Gateway Server.

Paper Space

The complete addressable area spanned by the proprietary Anoto pattern, the paper space, is divided into a multitude of domains varying in size, some pre-defined for certain applications like a digital notepad, while others are licensed to interested companies and authorities. The area within a domain can be used for a range of applications, each with its own functionality assigned. Certain areas of the paper domain with Function Pattern can e.g. be pre-defined to be sent via a mobile phone to the Internet.

The domain space allocation can have varying scope, ranging from a global license for an unlimited time, to limited licenses for specified markets, regions or applications. A global license will ultimately ensure the licence holder that anything written by anyone on the licensed domain will be channelled to the specified service provider.
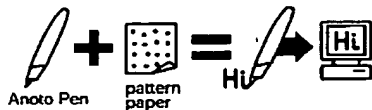
Printing

The pattern can be printed on any paper or other material allowing 1000 dpi resolution. The paper can have any desired size and shape depending on the intended use and design. A standard offset printing technique and ordinary black carbon-based ink are used.

It is only the carbon-based black ink that will absorb the infrared light and make the pattern visible for the digital camera in the pen. This means that other colors, including noncarbon-based black, can be used to print whatever required on top of the Anoto pattern without disturbing the function of the pen.

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Anoto Technology

Anoto Pen + pattern paper = Hi → Hi

The Anoto Technology is a combination of an ingenious pattern, advanced image processing, Bluetooth™ wireless communication and an information infrastructure. These features let you use pen and paper together with all the possibilities of information technology.
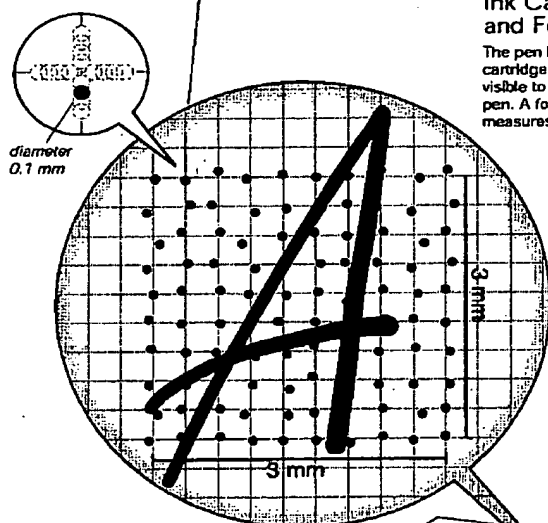
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The Bluetooth wireless technology is a de facto standard that enables all things that are now connected by cable to be connected without cables.

Battery
A rechargeable battery enables a full day of use.

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3 mm

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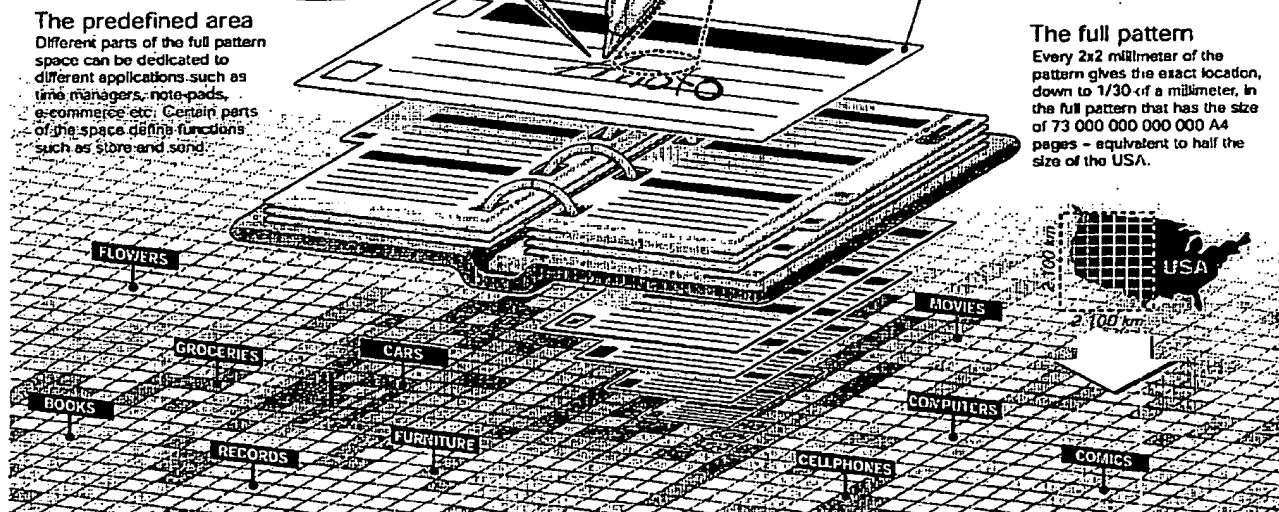A dedicated image processor calculates the positions in the full pattern space in real time.

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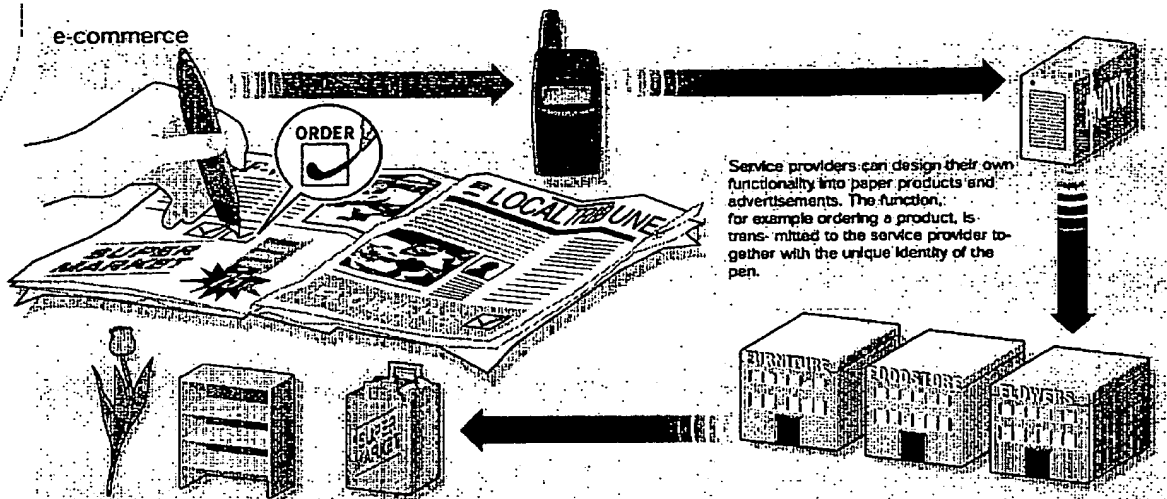
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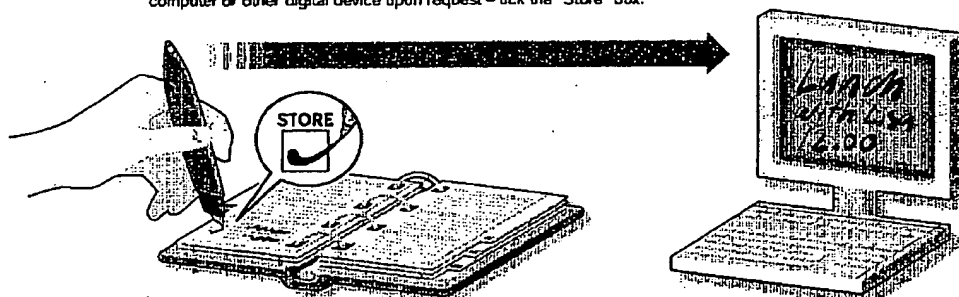
FLOWERS GROCERIES CARS BOOKS RECORDS FURNITURE CELLPHONES MOVIES COMPUTERS COMICS USA

2 100 km

Applications

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e-commerce

ORDER

LOCAL TRIBUNE

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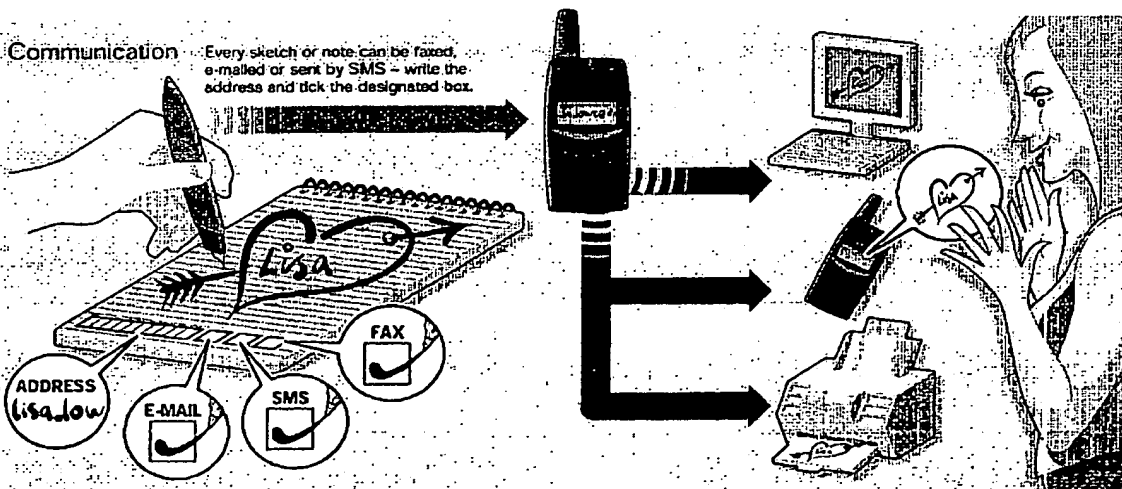
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STORE

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Every sketch or note can be faxed, e-mailed or sent by SMS – write the address and tick the designated box.

ADDRESS
lisa.low

E-MAIL   SMS   FAX

anoto™

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The Anoto Pen

Using an Anoto pen is not in any way different from using an ordinary ballpoint pen. It looks the same, has the same functions, feels the same and there are no buttons or display. The paper is the interface to an abundance of applications that can be changed and refined over time, while the pen itself doesn't have to be upgraded or replaced as a result of application evolution.

Technology

The Anoto pen consists of three main parts: the digital camera, an advanced image processing unit and a Bluetooth™ [1] radio transceiver.

Close to the point of the pen is the optics for the CMOS camera and an infrared LED. Infrared light is absorbed by the dots in the pattern and makes them visible for the camera. Digital snapshots, at a rate of 100 per second, are taken of the pattern.

The image processor [2] calculates, in real-time, the coordinates that will give an exact position in the entire Anoto proprietary pattern. During the image processing, snapshots are compared and information about how the pen is held is also gathered and stored. The angle between the point of the pen and the paper is calculated as well as the turning of the pen. At the upper part of the ink container a pressure sensor measures the force used at the point of the pen while writing. To all the information gathered above is added an accurate time-stamp. The information collected through each snapshot consists of:

- x/y coordinates
- angle between pen and paper
- turning of the pen
- pressure against the paper
- accurate time-stamp

Block letters and figures, entered in e.g. pre-defined address fields, can be converted to ASCII format.

The x/y flatfile is compressed and encrypted. All resulting data are packeted and put in an intermediate storage which can accommodate the code for numerous fully written letter pages.

Finally, the information is transmitted over a Bluetooth radio link, either directly to a computer where a facsimile of the handwriting on the paper is produced, or forwarded via a relay device (e.g. mobile phone, PC or PDA) to the Anoto Gateway. From the gateway some information will be forwarded for further processing elsewhere.

Note that a minimum of information interpretation is performed in the pen, this is done on a high-end server running the most powerful software available to the industry.

Software

A standard synchronization software for the PC is a part of the Anoto system, which enables the pen to interact with standard calendar functions and digital notebooks. The latter looks and feels like an ordinary notebook but give the user the possibility to search the notes for a special time, a specific key word or an action.

Usage

Knowledge of handwriting on paper is enough to store your written notes, send e-mail, SMS, fax, fill out forms, etc. The pen creates a digital trace of whatever is written or drawn and stores it in the pen until it's forwarded, via a Bluetooth radio link, to the relay device or final destination.

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[1]   The Bluetooth wireless technology is a specification for small-form factor, low-power, short-range radio links between mobile PCs, mobile phones and other digital devices. The Bluetooth radio enables fast and secure transmission of both voice and data, as well as communication compatibility worldwide. Instant connections between devices with built-in Bluetooth wireless technology are maintained even when the devices are not within line of sight. (www.bluetooth.com)

[2]   A proprietary ARM-based ASIC (70 MHz)

The Anot Infrastructure

The use of the pen and the paper interface can be classified into three main groups:

1. Analogue input / Digital output
   Examples: notebooks, Time Manager™, Mind maps, etc.
2. Communication
   Examples: graphical e-mail, SMS, fax. etc.
3. Services
   Examples: electronic payment, advertisements, menus, order forms, postcards, etc.

Companies can also use the technology to create customized and very powerful systems for data collection, document/goods tracking, journal keeping, etc.
The Anoto pen can link a piece of paper with the unlimited possibilities of the Internet.

Analogue Input / Digital Output

Applications in this group use the pen and paper mainly as input devices to the computer, PDA or mobile phone. Text written and sketches drawn in, e.g. a notebook, are transferred via a Bluetooth radio link as images directly to the computer synchronized to the pen as soon as the 'Store- box' at the bottom of the page is checked. But the notebook paper may also contain other boxes to express certain actions to be taken with the notes. One example is to write an address in block letters[3] and then touch the 'Address-box' on the paper with the pen. The address will then be copied into the computer's address book in the correct format. A similar scenario would be to have a 'To-do-box' on the paper.

On the computer, the notes, calendar sheets, etc. are digitally filed as images but with the possibility to search for key words that were entered as block letters and for the date the note was written.

Communication

This group requires more 'intelligence' from the paper and also access to the Internet. Sheets in a note book, Time Manager, etc., can be prepared as forms for sending a graphical e-mail (Ge- mail), SMS or fax. Printed on the page are entry fields for block letters stating addressee and subject, a free message area plus a 'Send Mail' check-box in the bottom corner of the paper. When the entry fields are completed and the message written, a mark in the check-box will trigger the pen to establish contact with the mobile phone over a Bluetooth radio link. The phone identifies the message as intended for the "Anoto Gateway Server" and the Ge-mail information is transferred to the base station using GPRS[4] and then by means of TCP/IP onward to the Anoto Gateway where the address field is decoded and the message dispatched over the Internet to the to the addressee. A confirmation of delivery to the Internet is shown on the mobile phone display.

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[3] Block letters in dedicated fields are converted to ASCII format by the pen.
[4] The Anoto pen works with all present and future mobile phone systems, including GSM.
    GPRS (General Packet Radio Services) a new packet based technology that will allow up to 115 kbit/s over the mobile network, compared to the 9.6 kbit/s available via GSM. The third generation mobile phone systems like WCDMA (UMTS) and CDMA2000 will within the next couple of years increase the data rates even more (384 kbit/s).

Services
These functions require a more extensive intervention by the Anoto Gateway. One example could be an advertisement in a magazine, perhaps combined with an order form.

With parts of the advert printed on the Anoto pattern, a reader can request additional information by stating address and checking a box. In an advertisement for flowers the possibility to order worldwide delivery can be added. The delivery address is stated along with the credit card no., expiry date and the number of e.g. roses. Finally, a personal handwritten message or drawing is entered for the accompanying card, which possibly can also be selected in the advert.

In the case above, the Anoto Gateway decodes the information and forwards the request, address information and completed greeting card to the server of the advertising company where the credit card is billed and a delivery order to an nearby local flower shop is issued, greeting card enclosed.

In another scenario, the dynamic information about how e.g. a signature actually was written (speed, pressure, angle, turning) can be used for authentication.

Pap r's back

New Scientist vol 166 issue 2234 - 15 April 2000, page 6

Just when you thought you need never pick up a pen again

IT'S goodbye to the idea of the paperless office: a new electronic pen could bring paper back with a bang. Instead of tapping away on a computer keyboard, the new pen lets you scribble e-mails freehand on special paper and then send it across the Internet via your mobile phone.

The pen, made by Anoto of Lund, Sweden, has a standard ballpoint nib and the maker is touting it as the only thing you'll need to talk to your computer, apart from the paper supplied in the form of a personal organiser.

As you write an appointment in your organiser, your words are recognised by a camera in the pen and instantly transmitted to a PC where they appear in a Microsoft Outlook organiser package. Similarly, you can draw pictures or write messages in your own scrawl—or have it converted to text—before choosing to e-mail it, fax it or send it as a text message via your mobile phone.

The pen will open up an entirely new market in e-commerce by letting you buy items advertised in a magazine just by scribbling your credit card details on the page and ticking the "buy" box. The plan is to have special advertisements on the magazine page printed with the dot pattern to allow the pen to do this.

The paper has millions of imperceptible dots printed on it in an asymmetrical pattern (see Diagram). The pen scans the dots to figure out precisely where it is on the page. It can do this to an accuracy of 30 microns, says Christer Fåhraeus, founder and chief executive of Anoto. In fact, he says, the pattern of dots also contains coordinate information about what page it is on and where the page comes from, distinguishing between an ad or a page in a calendar, say.
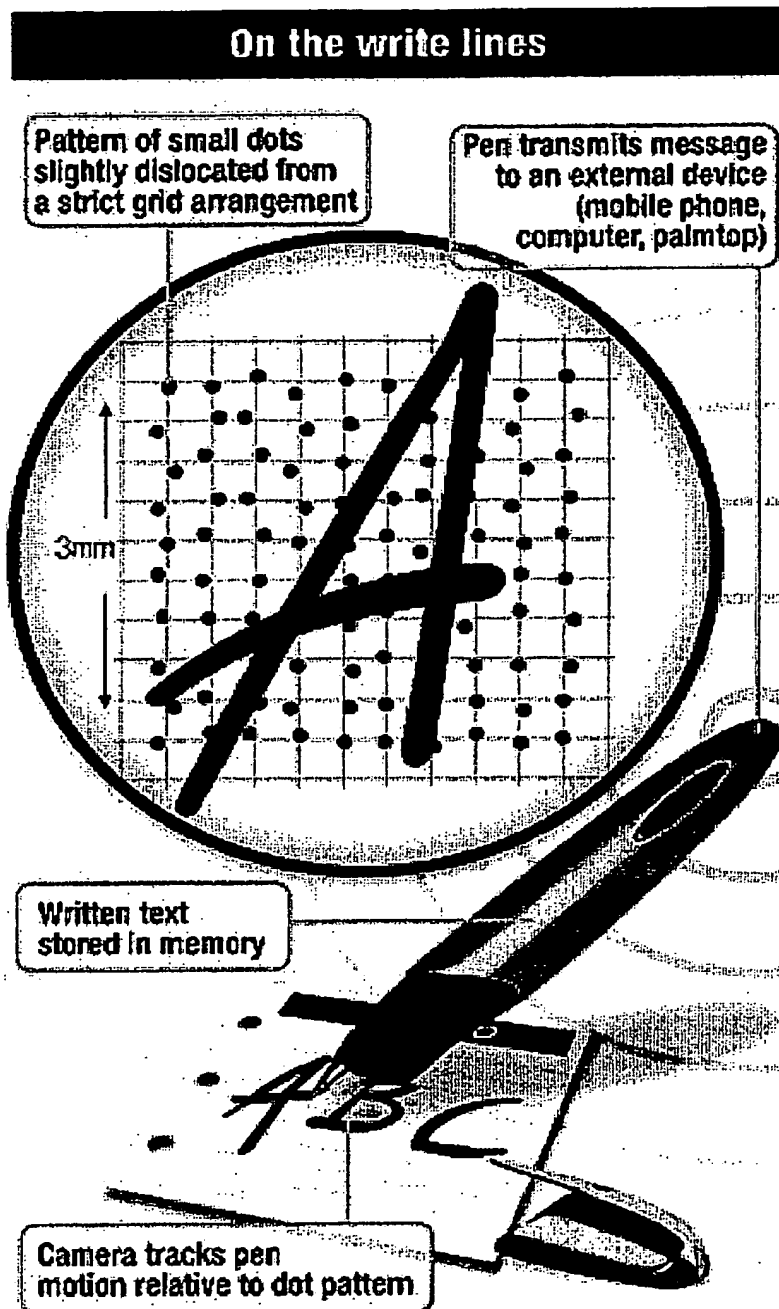
This means you can treat a normal-looking piece of paper as if it were a windows-like screen on a computer, where you can point and click on printed buttons—although it's more a case of point and tick. Anoto joined forces with personal organiser company Time Manager to produce pages incorporating such features.

The pen scans the page with its infrared camera that ignores the ink and follows the pen's movement instead. The pen can store an entire notepad's worth of information in its memory. A transmitter/receiver sends this information to a nearby mobile phone, PC or palmtop via a 2.4 gigahertz microwave signal conforming to the new Bluetooth standard, which lets devices communicate up to a range of 10 metres.

By 2004, there will be around 600 million mobile Internet subscribers, predicts Jan Ahrenbring of Ericsson, which part owns Anoto. When the pen is launched early next year—at around $100—they expect the Anoto to attract these surfers because it is so easy to use. You take the lid off to turn it on, and then start writing. And despite the influx of voice recognition technology, Ahrenbring believes that people won't easily give up the pen. "Handwriting is very much part of your personality," he says.

Duncan Graham-Rowe

On the write lines

Pattern of small dots slightly dislocated from a strict grid arrangement

Pen transmits message to an external device (mobile phone, computer, palmtop)

3mm

Written text stored in memory

Camera tracks pen motion relative to dot pattern

Message transmission via electronic pen and paper